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MEMO

TO: All Apollo Personnel
FROM: Philip G. Felleman
DATE: 4 January 1974 3
SUBJECT: Apollo 17 Mission Report

With the essentially fault-free flight of Apollo 17, a significant period in the Lab's history comes to a close. Many of us are experiencing mixed emotions at the end of what for us was an eminently successful program. We would like to continue the adventure of extraterrestrial exploration and yet we also look forward to developing new technologies for use in other space flight programs. Of course, SKYLAB and ASTP (the international docking mission) lie ahead and many of us continue to have software and hardware support responsibilities for these upcoming missions over the next two years. I am sure that the Lab will continue to provide the type of support which has become its hallmark over the duration of the Apollo program. We can all look back with a sense of pride and satisfaction of a total job well done; from the design through mission support of an outstanding guidance, navigation and control system. As I reminisce over the last eleven manned flights, I recall moments of concern to us all relating to events which made our contributions meaningful in real-time support. There are elements of humor in retrospect (although usually not at the time) that several of these "happenings" bring to mind. I recall Apollo 7 and the "stuck PIPA" and Wally Schirra's reaction to testing it as well as seeing 1300 restarts in the computer trying to find the square root of a negative number; I recall the "travelling trunnion" problem of Apollo 8 shortly before the first Lunar Orbit Insertion and the mad scramble of verifying the computer's integrity and later the shock of seeing a pre-launch program running during trans-earth coast. Apollo 9 had one optics axis stuck when a gear broke in flight and we saw our first rendezvous.

Apollo 10 let us design a Passive Thermal Control capability in real-time which worked well. We all recall the few moments just prior to landing on Apollo 11 when alarms flashed on the DSKY, but were all able to breathe easier as the landing proceeded to the first touchdown. Apollo 12 gave us some problems just prior to lift-off with the "all eights on the DSKY", but that problem became insignificant as 30 seconds into flight, lightning effects caused the Inertial Measurement Unit to lose its attitude reference. After orbit insertion, however, all was well and that mission proceeded nominally. Apollo 13 caused many of us to work and worry round the clock in order to verify the procedures designed for the aborted mission. We "sweated out" the fact that our system was turned off for three days prior to entry-in fact that was the most accurate entry of all. Apollo 14 and the abort button which threatened to terminate the mission prematurely resulted in our first real-time Erasable Memory Program. I believe that without that procedure, there would not have been a landing on that mission. Apollo 15 required a new EMP for the possibility that the landing radar meters did not work (the glass was cracked). The meters did work. Apollo 16 and the rate feedback signal loss on the SPS engine delayed landing by two hours, but rapid response assured the ability to use the engine satisfactorily. In addition to all of these, there was always a proliferation of "what if?" questions which we responded to, concerning both software and hardware.

I want to take this opportunity to thank all of you who provided mission support during these last several years. I especially want to thank the people who at KSC, MSC and SCAMA room allowed us to do our job so effectively. I believe I speak for the entire Laboratory in saying "well done".